

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF MISSOURI  
EASTERN DIVISION**

MICHAEL DAILEY and ROBBIN DAILEY,

Plaintiffs,

v.

BRIDGETON LANDFILL, LLC,  
ROCK ROAD INDUSTRIES, INC.,  
REPUBLIC SERVICES, INC.,  
ALLIED SERVICES, LLC, and  
COTTER CORPORATION (N.S.L.),

Defendants.

No. 4:22-cv-00116-CDP

**DECLARATION OF JOHN KINNEMAN IN SUPPORT OF  
DEFENDANT COTTER CORPORATION (N.S.L.)'S  
OPPOSITION TO PLAINTIFFS' MOTION FOR REMAND**

RILEY SAFER HOLMES & CANCILA LLP  
Brian O. Watson, #68678MO  
Lauren E. Jaffe, #6316795IL  
Jennifer Steeve, #308082CA  
Nacenté Seabury, #67248MO  
70 W. Madison St., Ste. 2900  
Chicago, Illinois 60602  
(312) 471-8700 (main)  
(312) 471-8701 (fax)  
[bwatson@rshc-law.com](mailto:bwatson@rshc-law.com)  
[ljaffe@rshc-law.com](mailto:ljaffe@rshc-law.com)  
[jsteeve@rshc-law.com](mailto:jsteeve@rshc-law.com)  
[nseabury@rshc-law.com](mailto:nseabury@rshc-law.com)  
[docketdept@rshc-law.com](mailto:docketdept@rshc-law.com)

**ATTORNEYS FOR DEFENDANT  
COTTER CORPORATION (N.S.L.)**

Declaration of John D. Kinneman, CHP

1. My name is John D. Kinneman. I am a Certified Health Physicist (CHP) with nearly 40 years' experience in the Federal regulation of radioactive materials, as an employee of the U. S. Nuclear Regulatory Commission (NRC).
2. The purpose of this Declaration is to explain the regulatory status of the material possessed by Cotter Corporation (N.S.L.) from late 1969 until 1974 in connection with the Latty Avenue site in Hazelwood, Missouri including the material disposed at the West Lake Landfill.
3. As shown below, from the time of the initial sale of this material by the Government in 1966 until the termination of Cotter's Source Material License in 1974, this material was continuously identified as "source material" and subject to the Federal requirements that a license be obtained to permit possession of it and that it be used in compliance with the regulations of the Atomic Energy Commission (AEC) and the terms of an AEC license. I have seen no evidence in the voluminous record associated with this facility that would indicate to me that any of the material possessed by Cotter at Latty Avenue could be considered to be "uranium mill tailings."

Qualifications

4. My full CV is attached to this Declaration, but here is a brief summary of my experience. I have been a Certified Health Physicist since 1983. This Certification is granted based on experience and examination by the American Board of Health Physics. I am a Fellow of the Health Physics Society and have been a member of that organization since 1976. I received a Bachelor of Science degree in Biochemistry from Rutgers University in 1971. I also spent two semesters at Rutgers continuing graduate study in health physics, radiation chemistry,

radiation dosimetry and environmental science and conducting independent research in radiation chemistry.

5. In 1975, I joined the Region I Office of the US Nuclear Regulatory Commission (NRC) (the regulatory portions of the AEC were transferred to the newly created NRC in 1974) as a Radiation Specialist. During my almost 40-year career with the NRC, I served in a series of increasingly responsible staff and management positions in the Region I Office in King of Prussia, PA, and then the Office of Nuclear Materials Safety and Safeguards in Rockville, MD. I also served as the radiation safety officer for the NRC's Region I Office. I retired from the position of Director of the Division of Fuel Facility Safety and Safeguards in the NRC Headquarters Office, a Senior Executive Service position, in 2013.
6. While at NRC, my activities included: conducting safety reviews of applications for NRC licenses for radioactive materials users (hospitals, universities, and manufacturing facilities including those using source material) to ensure proposed safety programs were adequate; inspecting construction, operational safety, and emergency preparedness at radioactive materials users to determine whether safety programs were adequately implemented; developing inspection procedures and standard review plans for licensee applications; and evaluating the effectiveness of programs to regulate radioactive materials safety to determine if specific Agreement States were ensuring safety through their regulatory programs.
7. I responded to accidents and events involving ionizing radiation and radioactive material as an NRC team manager and team member, including on-scene responses to the Three Mile Island (TMI) accident, many worker radiation overexposures, radioactive contamination in public areas, patient misadministrations of radiation and radioactive drugs, and other significant events; ensured the licensees took

appropriate action to protect workers and the public and prevent recurrence; and independently developed sequences of events, root and contributing causes based on findings in the field.

8. During my career, I also participated in related training courses including Radiation Dosimetry, Root Cause Analysis and Incident Investigation Training as a trainee, instructor and role player for mock incident investigations.
9. Some of my important accomplishments include significant contributions to the development of the National Site Decommissioning Management Plan (SDMP) and managing NRC technical activities associated with that program, resulting in more than 12 significant and many lesser contaminated sites being completely remediated and released for unrestricted use. I directed major investigations into substantial radioactive contamination in the public domain. These projects included conducting and managing environmental field measurements of radioactive materials, modeling of radiation doses and assessments of remediation plans both prior to and following implementation.
10. Additional activities at NRC included: Leading many public and internal meetings regarding safety issues at nuclear facilities. I led or managed assessment teams that reviewed safety and regulatory issues at NRC licensees and Agreement States and have evaluated safety and regulatory issues in developing countries for the International Atomic Energy Agency (IAEA).
11. I also have served as a guest lecturer at the Harvard University School of Public Health and the Columbia University School of Public Health, a lecturer at the Health Physics Society Summer School, and a developer of and lecturer at NRC training courses. Currently, I volunteer with the American Board of Health Physics in the development and grading of examinations for Certification in Health Physics.

## Background

12. Congress created the Atomic Energy Commission (AEC) in 1946 with the passage of the Atomic Energy Act (AEA)<sup>1</sup>. In 1954, Congress amended the AEA, finding among other things that “the processing and utilization of source, byproduct, and special nuclear material must be regulated in order to provide for the common defense and security and to protect the health and safety of the public.”<sup>2</sup>
13. In 1957, the AEC promulgated 10 CFR Part 20 “Standards for Protection Against Radiation”<sup>3</sup> (Part 20). This regulation established permissible doses of radiation to workers and the public, radiation levels in unrestricted areas, and radionuclide concentrations in effluents released to unrestricted areas. Appendix B to Part 20 established concentrations above natural background in air and water that would be permitted for each of the radioactive isotopes subject to this regulation.
14. During the period when Cotter possessed radioactive materials at Latty Avenue, Part 20 included two provisions establishing limits for the protection of the general public from radiation exposure. These provisions were Section 20.105, “Permissible levels of radiation in unrestricted areas,” which limited the radiation levels in unrestricted areas and, therefore, the radiation dose that a member of the public could receive from the facility and Section 20.106, “Radioactivity in effluents to unrestricted areas,” which limited the concentration of radioactivity permissible in releases from the facility to the limits set forth for each isotope in Appendix B to Part 20. Part 20 also included Section 20.301 which limited the disposal of licensed material. The AEC

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<sup>1</sup> Atomic Energy Act of 1946 (Public Law 585, 79th Congress).

<sup>2</sup> Atomic Energy Act of 1954 as amended, USNRC NUREG-0980, Vol. 1, No. 9, Jan. 2011 (codified at 42 U.S.C. § 2012).

<sup>3</sup> 10 CFR Part 20, Standards for Protection Against Radiation, Federal Register, 22 FR 548, Jan. 29, 1957.

inspections of source material licensees included evaluations of compliance with these requirements.

15. In 1947, AEC adopted 11 CFR Part 40 - "Control of Source Material.<sup>4</sup>" In 1961, the AEC adopted a "an overall revision,<sup>5</sup>" including revising the title, of 10 CFR Part 40 – "Domestic Licensing of Source Material<sup>6</sup>" (Part 40). The revised Part 40 continued to require a Federal license for the possession and use of source material and added requirements for the application and issuance of those licenses. The AEC stated the Purpose of Part 40, as follows:

The regulations in this part establish procedures and criteria for the issuance of licenses to receive title to, receive, possess, use, transfer, deliver, or import into or export from the United States source material and establish and provide for the terms and conditions upon which the Commission will issue such licenses<sup>7</sup>.

The Part 40 definition of "source material" was (and continues to be):

(1) uranium or thorium or any combination thereof, in any physical or chemical form or (2) ores which contain by weight one-twentieth of one percent (0.05%) or more of (i) uranium (ii) thorium or (iii) any combination thereof.

16. Both Part 20 and Part 40 applied continuously throughout the period 1966-1974 when radioactive material was present at Latty Avenue and continue to apply (as amended) to similar activities today.

#### Sale of the St. Louis Airport Residues

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<sup>4</sup> Federal Register, 12 FR 1855 to 1856, March 20, 1947.

<sup>5</sup> Federal Register, 25 FR 8619, September 7, 1960.

<sup>6</sup> 10 CFR Part 40, Licensing of Source Material, Federal Register, 26 FR 284, January 14, 1961.

<sup>7</sup> 10 CFR 40.1 "Purpose."

17. The Government's radioactive residues that ultimately were transported to the Latty Avenue site were initially offered for sale by the AEC in a Request for Proposals (RFP) that was issued on June 10, 1960. The RFP included the following description of the residues:

Description of Residues. The residues offered for sale consist of uranium-bearing scrap material accumulated by the Commission during its uranium refining activities at its Destrehan Street Plant, St. Louis, Missouri.<sup>8</sup>

Five categories of material were offered for sale, which included Pitchblende Raffinate, Colorado Raffinate, Barium Sulfate Cake (unleached), Barium Cake (leached), and Miscellaneous Residues. The "total metal values" of the Pitchblende Raffinate was estimated by the AEC to be 1,775,000 lbs. of Cobalt, 2,085,000 lbs. of Nickel, and 1,098,000 lbs. of Copper.

The RFP included provisions related to licensing requirements for the purchase of this material, which stated:

General Terms and Conditions. Any contract or contracts resulting from subsequent negotiations following proposals submitted as a result of this request shall contain those provisions required by existing laws, executive orders, and applicable rules and regulations of the Commission. In addition, the purchaser, in performing any such contract, must comply with the applicable licensing requirements and regulations pertaining to source material as set forth in 10 CFR part 20 and 40. [Emphasis added]<sup>9</sup>

Nowhere in the eight pages of the RFP was any of the material being offered for sale referred to by the AEC as "uranium mill tailings."

The RFP provided that any material remaining after the extraction of contents of value from the radioactive material could be disposed of by

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<sup>8</sup> COTTER00002563, COTTER\_WLL00000388.

<sup>9</sup> COTTER00002569, COTTER\_WLL00000394.

the purchaser in a dump site at the Weldon Spring Quarry. However, later in 1960, the AEC was asked not to award a contract to a private company pursuant to this RFP because of concerns by the U.S.

Geological Survey about possible contamination of the Missouri River from the quarry. So, no contract was awarded at that time.<sup>10</sup>

18. The AEC again requested private companies to bid on the purchase of the airport residues in an invitation to bid issued on January 10, 1964<sup>11</sup>. The description of the residues in Article I of the invitation was the same as in the AEC's 1960 RFP. The AEC additionally noted that the material "contains one the largest known amounts of concentrated scandium and ionium<sup>12</sup>." The invitation provided that the words "residues," "property," and "materials," are used interchangeably throughout the document and referred to the description of the uranium-bearing material described in Article I.

The licensing requirements applicable to the sale in this 1964 invitation to bid were more explicit than the 1960 RFP, stating:

#### ARTICLE V - LICENSE REQUIREMENTS

The residues described herein constitute source material, the receipt, possession, use or transfer of which are subject to licensing requirements and regulations promulgated by the Commission pursuant to the Atomic Energy Act of 1954, as amended (42 USC 2011). Accordingly, purchasers must obtain a license and comply with the requirements of the regulations pertaining to source material as set forth in 10 CFR, Parts 20, 40 and 70<sup>13</sup>. [Emphasis added]

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<sup>10</sup> COTTER00005325.

<sup>11</sup> COTTER00002506.

<sup>12</sup> COTTER00002507

<sup>13</sup> COTTER00002517.

Nowhere in the 13 pages of the invitation to purchase was any of the material being offered for sale referred to by the AEC as "uranium mill tailings."

19. The material offered for sale by the AEC was sold in a negotiated sale to Continental Mining and Milling Company (CMM) in February 1966.<sup>14</sup> The description of the material being sold and the approximate quantities described in the Bill of Sale were the same as had originally been offered by the AEC in its 1960 RFP. Nowhere in the Bill of Sale was any of the material referred to as "uranium mill tailings."
20. The Bill of Sale included the following requirements:

4. License Requirements. The material sold hereunder contains more than 0.05% uranium and therefore constitutes source material subject to licensing requirements and regulations promulgated by the Commission pursuant to the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011). Accordingly, the Purchaser must obtain a license and comply with regulations pertaining to source material as published in 10 Code of Federal Regulations, Parts 20 and 40, prior to taking possession of the material sold hereunder<sup>15</sup>. [Emphasis added]

On February 8, 1966<sup>16</sup> CMM applied for and later received AEC Source Material License No. SMA-862 to allow CMM to possess these materials. The AEC conducted inspections of CMM's compliance with AEC regulations and with its license on May 16 and 17 and August 4, 1966<sup>17</sup>.

21. In January 1967, the Commercial Discount Corporation (CDC) took physical possession of the Continental Mining and Milling Company facilities and its stockpile of source material. CDC applied for an AEC

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<sup>14</sup> COTTER00006262, COTTER\_WLL00000500.

<sup>15</sup> COTTER00006263, COTTER\_WLL00000501.

<sup>16</sup> COTTER00000730.

<sup>17</sup> Form AEC-592 Report, March 27, 1968 (COTTER00002647).

Source Material License to possess this material on December 15, 1966<sup>18</sup>, stating that it was seeking a license to possess the radioactive material "for the purpose of possible foreclosure liens and security interests involving storage and resale only." The CDC license application also stated, "Applicant will not process source material in any way."

22. The AEC issued Source Material License SMC-907 to CDC on December 29, 1966<sup>19</sup>. Under this license, CDC was authorized to possess "uranium and thorium" at the Latty Avenue site. On June 28, 1967, the license was amended to allow CDC to "condition the source material by drying to 15% moisture content loading the material to rail cars and shipping the material.<sup>20</sup>" The AEC conducted an inspection of CDC's compliance with AEC regulations and with its license on March 27, and April 1, 1968<sup>21</sup>.

#### Purchase of the Residues by Cotter

23. On May 8, 1969<sup>22</sup>, AEC provided a copy of the 1964 Invitation to Bid for the material originally purchased by CMM and then in possession of CDC to Cotter. The Invitation to Bid clearly identifies the 8700 tons of "Barium Cake (Leached)" as a material included in the sale and subject to the AEC's requirements for a license.<sup>23</sup> In December 1969, Cotter purchased the residues at the Latty Avenue site from CDC. In order to satisfy the AEC's licensing requirements for possessing these materials,

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<sup>18</sup> COTTER00000727-31.

<sup>19</sup> Letter D.F. Harmon (AEC) to A.R. McPherson, Jr. (CDC) dated December 29, 1966 with enclosed License No. SMC-907 (COTTER000004755-56)

<sup>20</sup> Form AEC-592 Report March 27, 1968 (COTTER00002648).

<sup>21</sup> Form AEC-592 Report March 27, 1968 and Letter dated April 5, 1968 (COTTER00002645-57).

<sup>22</sup> COTTER00002505.

<sup>23</sup> COTTER00002516.

Cotter applied to the AEC for a source material license on December 16, 1969<sup>24</sup>. Cotter's license application described its planned activities as:

No processing. Material is to be conditioned by drying to 15% moisture content and loaded into rail cars for shipment to Canon City, Colorado.<sup>25</sup>

As Cotter's application made clear, the material was to be dried at Latty Avenue and shipped to Cotter's uranium mill in Colorado, where processing would occur. Cotter did not need a license at Latty Avenue to process the material, which would be done elsewhere. It needed a license to possess it and conduct the drying activity, because it was source material. On December 30, 1969, the AEC issued Source Material License No. SUB-1022 to Cotter to authorize possession of source material at the Latty Avenue site, "For use in accordance with the procedures described in the licensee's application dated December 16, 1969."<sup>26</sup>"

24. Cotter purchased the residues from CDC on December 29, 1969.<sup>27</sup> The Bill of Sale for this purchase included the following requirement:

Buyer shall restore the surface of that portion of the Missouri site upon which the ore residue materials were stockpiled in a manner sufficient to meet the requirements of the above described lease, the requirements of the Atomic Energy Commission and the State of Missouri, . . . [Emphasis added]

25. The AEC conducted inspections of Cotter's activities authorized under Source Material License No. SUB-1022 on November 17, 1970<sup>28</sup> and then again on April 10 and 24, 1974. The AEC inspection report for the April inspections stated that they were "an examination of the decommissioning operations at the Hazelwood, Missouri site." The

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<sup>24</sup> COTTER00000805, COTTER\_WLL00000367.

<sup>25</sup> COTTER00000806, COTTER\_WLL00000368.

<sup>26</sup> COTTER00000816, COTTER\_WLL00000373.

<sup>27</sup> COTTER00005161, COTTER\_WLL00000491

<sup>28</sup> RO Inspection Report November 17, 1970 (COTTER000002451-2461).

report included this description of Cotter under its Latty Avenue license: "Type of Licensee: Uranium ore residue storage and shipment<sup>29</sup>."

Nowhere in the inspection reports for these inspections did the AEC refer to the materials at Latty Avenue as "uranium mill tailings."

26. These AEC inspections did not identify any violations of Part 20 Sections 20.105 or 20.106 during the period when Cotter held a Source Material License for its operations at Latty Avenue and I have seen no evidence that offsite emissions from the Latty Avenue site exceeded the limits in either of those regulations during Cotter's activities.

#### Disposal of Leached Barium Sulfate Residues (LBSR)

27. The cover letter to the AEC's April 1974 inspection report noted that "during the period of July - October 1973, about 8700 tons of leached barium sulfate residue containing about seven tons or averaging about 0.08% natural uranium was scooped up for disposal with approximately 39,000 tons of soil, and the resulting uranium concentration was about .0001%<sup>30</sup>." A later report noted that this material had been disposed at the West Lake Landfill<sup>31</sup> by B&K Construction Company, an independent local contractor, in connection with a local environmental engineering and consulting firm, Ryckman, Edgerley, Tomlinson & Associates (RETA), and local trucking firms, Walker Trucking Service, Bruce Barnes Truck Service, Vic Koepke Excavating and Grading Company, and H. Reeder Hauling, Inc.<sup>32</sup>.

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<sup>29</sup> RO Inspection Report No. 040-8035/74-01, May 17, 1974 (COTTER00007538).

<sup>30</sup> Letter J.G. Davis (AEC) to David P. Marcott (Cotter) dated November 1, 1974 (COTTER00006299)

<sup>31</sup> NRC IE Investigation Report No. 76-01, January 4, 1977 (COTTER00006204).

<sup>32</sup> NRC IE Investigation Report No. 76-01, January 4, 1977 (COTTER00006210).

28. The LBSR was composed of barium sulfate ( $\text{BaSO}_4$ ) and uranium and was therefore a chemical mixture. In the summer and fall of 1973, the LBSR was mixed with 38,000 to 39,000 tons of soil from the Latty Avenue site and transported to the West Lake Landfill for disposal<sup>33</sup>. The effect of mixing the LBSR with topsoil was to reduce the concentration of uranium to less than a licensable concentration. A simple analysis yields the following uranium concentrations:

$$\frac{7 \text{ tons uranium}}{8,700 \text{ tons of barium sulfate}} = 0.0805 \text{ weight \% uranium} \quad (\text{Equation 1})$$

$$\frac{0.0805 \text{ weight \% uranium} \times 8,700 \text{ tons barium sulfate}}{(8,700 \text{ tons barium sulfate} + 38-39,000 \text{ tons soil})} = 0.015 \text{ weight \% uranium} \quad (\text{Equation 2})$$

The 0.015 weight percent of uranium in the LBSR-soil mixture is about 1/3 of the exempt concentration of 0.05 weight percent of uranium in Section 40.13(a), so the mixture was well below the concentration limits in Part 40<sup>34</sup>. That is, the mixture was still source material, but was below a licensable concentration.

29. Cotter advised the AEC of the disposal of the LBSR in a meeting on September 26, 1973<sup>35</sup>.
30. AEC records noted the mixture and disposal of the LBSR in the report of the April 1974 inspection<sup>36</sup>. That report reads, in part

The apparent disposal of licensed source material in a manner not authorized was discussed as was the licensee's determination that the uranium content of residue ore was

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<sup>33</sup> AEC report of April 10 and 21-24, 1974 inspection. COTTER00001675-82.

<sup>34</sup> 10 CFR 40.13(a)

<sup>35</sup> 'Clean up, Latty Avenue Storage Site', Memorandum from Edward J. McGrath to David P. Marcott, May 15, 1975, COTTER\_WLL00000439. See also Video Deposition of Edward J. McGrath, December 2, 2019, page 171.

<sup>36</sup> AEC report of April 10 and 21-24, 1974 inspection, op. cit.

reduced to a non licensable percentage by the addition of quantities of soil<sup>37</sup>.

31. Although the inspection report stated that Cotter was in violation of 10 CFR 20.301, 'Waste Disposal, General Requirement' in that disposal of licensed material made from July 31, 1973, through October 12, 1973, was in a manner not authorized, the contents of the inspection report are the opinion or recommendation of the inspector, not a formal decision by the AEC. Formal action is implemented by issuing a Notice of Violation.
32. As a result of the inspection, the AEC had internal discussions about whether to issue a Notice of Violation to Cotter for mixing the LBSR with soil prior to being transported to the West Lake Landfill, without prior AEC approval.
33. An internal AEC memo, dated May 17, 1974<sup>38</sup> reads, in part:

We believe the licensee should be cited for a violation of 10 CFR 20.301. This, however, brings up the question of what would be an acceptable response and how we could reasonably expect Cotter to correct the situation.

34. A second AEC memo, dated June 26, 1974<sup>39</sup>, reads, in part:

We believe, along with RO:III [Directorate of Regulatory Operations, Region III], that the proper action to take is for RO:HQ to write to Cotter Corporation, citing them against 10 CFR 20.301 and requesting that they provide a detailed safety analysis of the consequences to be expected from permitting the uranium to remain at the site.

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<sup>37</sup> AEC report of April 10 and 21-24, 1974 inspection, page 2 op. cit.

<sup>38</sup> AEC internal memo from James Allan to H. D. Thornburg, May 17, 1974. NRC Accession Number ML13008A248 (pdf pages 6-7 of 13).

<sup>39</sup> AEC Internal memo from Gen W. Roy to H. D. Thornburg, June 26, 1974. NRC Accession Number ML13008A248 (pdf pages 1-2 of 13).

35. This memo also conveyed a draft enforcement letter to Cotter, which read, in part:

The inspection revealed that one of your decommissioning activities at Hazelwood, Missouri, appears to be in violation of AEC requirements. Specifically, it was ascertained that about 8700 tons of barium sulfate containing approximately 7 tons of natural uranium was disposed of at the St. Louis, Missouri County sanitary landfill area No. 1. during the period July - October 1973. Such disposal is contrary to Section 20.301 of 10 CFR Part 20, "Standards for Protection Against Radiation."

36. However, when the AEC wrote to Cotter on November 1, 1974<sup>40</sup>, transmitting the report of the April 1974 inspection, the agency did not cite Cotter for a violation of Part 20. The letter said, in part:

...during the period of July - October 1973, about 8700 tons of leached barium sulfate containing about seven tons or averaging about 0.08% natural uranium was scooped up for disposal with approximately 39,000 tons of soil, and the resulting uranium concentration was about .0001%<sup>41</sup>.

The disposal does not appear to be within the intent of the Commission's regulation, 10 CFR Part 40, to allow alteration of the physical nature of the Source material (i.e. dilution of solids with non-radioactive source material) in order to obtain a physical mixture which would no longer be subjected to licensing by the Commission.

37. The position taken by the AEC in this letter was substantially different from the one proposed in the June 26 internal draft. Thus, in its formal response to Cotter regarding the mixing of LBSR with topsoil at Latty Avenue, it is clear that the AEC was cognizant of Cotter's actions regarding the transfer of material to the West Lake Landfill but I have

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<sup>40</sup> Letter from John G. Davis to David P. Marcott, November 1, 1974. COTTER00001673-74.

<sup>41</sup> Letter J.G. Davis (AEC) to David P. Marcott (Cotter) dated November 1, 1974 (COTTER00006299)

found no evidence that the AEC ever cited Cotter for a violation of either Part 20 or Part 40 for this transfer.

38. Had the AEC chosen to act against Cotter, it had a number of regulatory tools available to do so. For example, Part 40.81, *Violations*<sup>42</sup>, enabled the AEC to use injunctions or court orders to enforce its regulations, and 10 CFR Part 2, *Rules of Practice*<sup>43</sup>, provided the AEC's procedures for imposing its requirements by order, or modification, suspension, or revocation of a license.
39. Based on the above documents and my own experience at the NRC, I therefore conclude that the AEC deliberately chose not to cite Cotter for a violation for diluting the LBSR.
40. This issue was directly addressed later in a memorandum from the NRC's Assistant General Counsel, which stated:

Whether there was a violation of 10 CFR 20.301, as stated in the inspection report, depends upon how 10 CFR 40.13(a) is construed. We note that there is nothing in that section or elsewhere in 10 CFR Part 40 that expressly prohibits dilution of source material in a mixture to below .05 weight percent in order for it to be exempted from the regulations in Part 40. If exempt, the requirement for transfer to an authorized recipient would not apply.<sup>44</sup>

Note that material can be "source material" and still be exempt from the licensing requirements of Part 40 if the weight percent of uranium in the material is below the 0.05 percent limit in 40.13(a) above.

41. I conclude that Cotter did not violate 20.301 because the LBSR-topsoil mixture was not licensable material and, thus, was not subject to the

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<sup>42</sup> 10 CFR Part 40.81, 1973, op. cit.

<sup>43</sup> 10 CFR Part 2, 36 FR 16894, 1971

<sup>44</sup> Memorandum from Stuart A. Treby, Assistant General Counsel for Rulemaking & Fuel Cycle, Office of the General Counsel to Richard E. Cunningham, Director, Division of Industrial and Medical Nuclear Safety, Office of Nuclear Material Safety & Safeguards, February 17, 1988, COTTER\_WLL00000405-407.

licensing requirements. When Cotter mixed the LBSR with topsoil, the mixture became an unimportant quantity under Part 40 (§ 40.13) and therefore, did not require a license so Cotter could transfer, and West Lake Landfill could receive and possess, the mixture.

42. Although the AEC noted that Cotter's dilution of solids with nonradioactive source material to reduce the radioactive content of the material below the level that would require a license "does not appear to be within the intent of the Commission's regulation 10 CFR Part 40<sup>45</sup>," no such finding or citation was issued. The initial AEC inspection report shows that the AEC considered citing Cotter for a violation of its waste disposal regulation (20.301) because it did not request prior approval for this dilution; however, the AEC did not cite Cotter for any violation of its regulations as a result of this disposal. Neither the AEC inspection report nor the letter referred to the 8,700 tons of leached barium sulfate as "uranium mill tailings."
43. On May 10, 1974, Cotter submitted a letter to the AEC certifying that it no longer possessed any radioactive material subject to the Commission's licensing requirements and requesting that Source Material License No. SUB-1022 be terminated<sup>46</sup>. On November 13, 1974, the AEC terminated Cotter's source material license.<sup>47</sup>
44. In June 22-24, and August 11, 1976, the NRC<sup>48</sup> conducted a special investigation of the disposal of "natural uranium ore residues" in the West Lake Landfill<sup>49</sup>. This investigation was in response to a request from the Missouri Department of Natural Resources, forwarding

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<sup>45</sup> Letter J.G. Davis (AEC) to David P. Marcott (Cotter) dated November 1, 1974 (COTTER00006299).

<sup>46</sup> COTTER00004989, COTTER\_WLL00000423.

<sup>47</sup> COTTER00006301, COTTER\_WLL00000432.

<sup>48</sup> The NRC began operation on January 19, 1975, U.S. NRC History, <https://www.nrc.gov/about-nrc/history.html>. The NRC assumed the regulatory activities of AEC, including the licensing and inspection of source material.

<sup>49</sup> NRC IE Investigation Report No. 76-01, January 4, 1977 (COTTER00006202).

newspaper articles containing allegations regarding this disposal. During its investigation, the NRC took environmental samples and conducted beta-gamma surveys at the Latty Avenue site and at the West Lake Landfill. The NRC revisited the Latty Avenue site in October and took additional environmental samples and alpha, beta-gamma direct surveys. The NRC's Investigation Report states:

Latty Avenue environmental samples confirm the removal of the bulk of materials but show that some residues remain. The Latty Avenue surveys showed radiation levels exceeding NRC criteria for decontamination of land areas prior to return to unrestricted use. The West Lake Landfill surveys indicated that radioactive material is buried there, and one environmental sample showed a slightly elevated natural uranium concentration. Based on the direct radiation surveys, neither site presents an immediate radiological health hazard to the public.<sup>50</sup>

The NRC investigation report stated that no "items of noncompliance were identified during this investigation." Although the issue of whether Cotter violated AEC or NRC waste disposal regulations was investigated, the AEC and NRC did not cite Cotter for a violation of or noncompliance with that regulation. Nowhere in this report does the NRC refer to any of the material at Latty Avenue or the landfill as "uranium mill tailings."

45. In 1978, the Congress passed a law to protect public health and safety from potential health hazards resulting from uranium mill tailings located at active and inactive uranium mills<sup>51</sup>. The law established two categories of uranium mill sites. Those uranium mill sites that were no longer active were called Title I sites and sites licensed in 1978 or later were identified as Title II sites. The law identified 21 inactive uranium processing sites in nine states as Title I sites. Neither the Mallinckrodt

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<sup>50</sup> NRC IE Investigation Report No. 76-01, January 4, 1977 (COTTER00006204).

<sup>51</sup> Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95-604) 95<sup>th</sup> Congress.

facilities in St. Louis nor Cotter's site at Latty Avenue was identified as a Title I site.

46. In previous litigation regarding the Latty Avenue site, the Risk Assessment Corporation (RAC) evaluated the residues stored at Latty Avenue and the St. Louis Airport, on behalf of Mallinckrodt<sup>52</sup>. As part of that effort, RAC explicitly considered whether the raffinate stored at these sites was "uranium mill tailings" and made the following conclusion in its report:

It is important to note that raffinate is neither uranium mill tailings nor an earthen material. Uranium mill tailings are the physical waste product resulting from the crushing and grinding of ore, followed by the uranium extraction process. As such, they are basically composed of the geologic materials comprising the ore host rock like sand and silt. Thus, uranium mill tailings typically contain little uranium, but retain the decay products including  $^{230}\text{Th}$  and  $^{226}\text{Ra}$ .<sup>53</sup>

Based on my review of the available information, I agree with that conclusion.

### Conclusions

47. Cotter's possession and use of radioactive materials at Latty Avenue was continuously subject to Federal (AEC) licensing requirements and regulatory oversight throughout the entire period when Cotter was conducting activities at Latty Avenue.
48. The radioactive material possessed by Cotter at Latty Avenue, including the undiluted leached barium sulfate residue (LBSR), was continuously identified by the AEC as "source material" as defined in 10 CFR 40 and regulated as such.

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<sup>52</sup> Risk Assessment Corporation (RAC) "Reconstruction of Plaintiff Doses Associated with Residues Stored at the St. Louis Airport Storage Site and the Hazelwood Interim Storage Site and Critique of Opinions by Dr. Clark, Dr. Hu, and Dr. Wells," March 17, 2020.

<sup>53</sup> Ibid, page 4-20.

49. In my review of Cotter's activities at Latty Avenue I have seen no evidence that any of this material was ever identified as license-exempt "uranium mill tailings."
50. The AEC did not find releases to unrestricted areas from the Latty Avenue facility to be in violation of either 10 CFR 20.105 or 10 CFR 20.106 while Cotter was the licensee. Further, I found no evidence that suggests offsite releases from Latty Avenue were in violation of these requirements during that period.
51. The LBSR mixed with soil and transported to the West Lake Landfill was less than 0.015 per cent by weight uranium, continued to be source material and was exempt from the requirement for a license and was, therefore, exempt from the requirements in 10 CFR 20.301.
52. The AEC did not find Cotter in violation of any regulation for its disposal of the LBSR to the West Lake Landfill. It did not issue any citation, fine, or penalty to Cotter as a result of this disposal.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on March 12, 2022.



John D. Kinneman, CHP